CLAIMS

What is claimed is:

1.   A method, comprising:

estimating an excess signal based on a non-linear decay response of a measured signal of an image frame; and

compensating for the excess signal in the image frame of an imaging system.

2.   The method of claim 1, further comprising selecting a frame rate.

3.   The method of claim 2, wherein compensating for the excess signal in the imaging system is based on the frame rate.

4.   The method of claim 3, further comprising subtracting an estimation of the excess signal from the measured signal of the image frame.

5.   The method of claim 4, wherein estimating the excess signal further comprises selecting a first reference image frame.

6.   The method of claim 5, wherein the first reference image frame is an exposed image frame.

7.   The method of claim 6, wherein the exposed image frame is a non-saturated exposed image frame.

8.   The method of claim 5, wherein the first reference image frame is a lag image frame.

9.   The method of claim 8, wherein the lag image frame is a non-saturated lag image frame.

10.   The method of claim 5, wherein the excess signal is estimated using a measured signal of the first reference image frame and a difference in time between a frame time of the first reference image frame and an end of exposure time of a radiographic image, the first measured signal value corresponds to the measured signal at the frame time of the first reference image frame.

11.   The method of claim 10, wherein estimating the excess signal further comprises calculating the excess signal as a function of an integration time.

12.   The method of claim 10, wherein estimating the excess signal further comprises calculating the excess signal using a power function.

13.   The method of claim 12, wherein the power function comprises:
        calculating a coefficient using the measured signal of the first reference image frame and the difference in time between the frame time of the first reference image frame and the end of exposure time of the radiographic image; and

calculating the excess signal using the coefficient and a frame time of a non-saturated image frame.

14.   The method of claim 10, wherein estimating the excess signal further comprises selecting the excess signal from a look-up table.

15.   The method of claim 14, wherein the look-up table comprises:
        a plurality of frame times;
        a plurality of measured signals, the plurality of measured signals corresponding to the plurality of frame times; and
        a plurality of pre-calculated excess signals, the plurality of pre-calculated excess signals corresponding to the plurality of frame times and the plurality of measured signals.

16.   The method of claim 15, wherein selecting the excess signal from the look-up table further comprises selecting a first pre-calculated excess signal from the look-up table using the frame time and the measured signal of the first reference image frame.

17.   The method of claim 16, wherein the plurality of frame times are frame numbers based on the frame rate.

18.   The method of claim 5, wherein estimating the excess signal further comprises selecting a second reference image frame.

19.   The method of claim 18, wherein the second reference image frame is an exposed image frame.

20. The method of claim 19, wherein the exposed image frame is a non-saturated exposed image frame.

21. The method of claim 18, wherein the second reference image frame is a lag image frame.

22. The method of claim 21, wherein the lag image frame is a non-saturated lag image frame.

23. The method of claim 18, wherein the excess signal is estimated using the measured signal of the first reference image frame and a difference in time between the frame time of the first reference image frame and a frame time of the second reference image frame.

24. The method of claim 23, wherein estimating the excess signal further comprises calculating the excess signal as a function of an integration time.

25. The method of claim 23, wherein estimating the excess signal further comprises calculating the excess signal using a power function.

26. The method of claim 25, wherein the power function comprises:
   calculating a coefficient using at least one of the measured signal of the first reference image frame and the measured signal of the second reference image frame and at least one of the frame time of the first

reference image frame and the frame time of the second reference image frame; and

calculating the excess signal using the coefficient and the difference in time between the frame time of the first reference image frame and the frame time of the second reference image frame.

27. The method of claim 18, wherein estimating the excess signal further comprises selecting the excess signal from a look-up table.

28. The method of claim 27, wherein the look-up table comprises:
a plurality of frame times;
a plurality of measured signals, the measured signals corresponding to the plurality of frame times; and
a plurality of pre-calculated excess signals, the plurality of pre-calculated excess signals corresponding to the plurality of frame times and the plurality of measured signals.

29. The method of claim 28, wherein selecting the excess signal from the look-up table further comprises selecting a pre-calculated excess signal from the look-up table using the frame time of the first reference image frame and the measured signal of the first reference image frame.

30. The method of claim 28, wherein selecting the excess signal from the look-up table further comprises selecting a pre-calculated excess signal from the look-up table using the frame time of the second reference image frame and the measured signal of the second reference image frame..

31.   The method of claim 28, wherein the plurality of frame times are frames numbers based on the frame rate.

32.   The method of claim 18, wherein estimating the excess signal further comprises calculating the excess signal of a next frame using a recursive function.

33.   The method of claim 32, wherein the recursive function comprises:

calculating a first coefficient using the measured signal of the first reference image frame and the measured signal of the second reference image;

calculating a second coefficient using the first coefficient; and

calculating the excess signal of the next frame using the second coefficient and at least one of the measured signal of the first reference image signal or the measured signal of the second reference image signal.

34.   The method of claim 4, wherein subtracting the estimation of the excess signal from the measured signal generates an estimated signal proportional to an integrated light intensity striking a photoconductor for a given integration time.

35.   The method of claim 4, wherein the estimation of the excess signal is derived by integrating a smooth curve fit of experimentally derived excess signal data as a function of time.

36.   The method of claim 4, wherein the estimation of the excess signal is derived by using a theoretical model expression.

37. The method of claim 4, wherein subtracting the estimation of the excess signal from the measured signal further comprises subtracting the estimation of the excess signal from the measured signal on a capacitor in the imaging system for a pixel for multiple frames.

38. The method of claim 3, wherein the excess signal is compensated for with frame rates faster than one tenth of a frame per second.

39. The method of claim 3, wherein compensating for the excess signal in the image frame comprises determining an estimation of the excess signal in a non-linear range of operation of the imaging system.

40. The method of claim 1, wherein a source of the excess signal is a thin-film transistor (TFT).

41. The method of claim 1, wherein a source of the excess signal is a capacitor.

42. The method of claim 1, wherein a source of the excess signal is a photodiode.

43. The method of claim 1, wherein a source of the excess signal is a photoconductor.

44. The method of claim 1, wherein the excess signal comprises a contribution from to a leakage current.

45.   The method of claim 1, wherein the excess signal comprises a contribution from a dark current.

46.   The method of claim 1, wherein the excess signal comprises a contribution from a lag current.

47.   The method of claim 4, wherein estimating the excess signal further comprises calculating the excess signal as a function of an integration time and using a look-up table.

48.   The method of claim 4, wherein estimating the excess signal further comprises calculating the excess signal from a power function and a look-up table.

49.   The method of claim 4, wherein estimating the excess signal further comprises calculating the excess signal as a function of an integration time.

50.   The method of claim 49, wherein the integration time is based on the frame rate.

51.   The method of claim 50, wherein the integration time is the reciprocal of the frame rate.

52.   The method of claim 51, further comprising calculating the estimation of the excess signal based on a constant value and the frame rate.

53.   The method of claim 52, further comprising determining the constant value.

54.   The method of claim 53, wherein determining the constant value comprises testing a sensor array through a non-linear range of operation.

55.   The method of claim 53, wherein determining the constant value comprises simulating behavior of a sensor array through a non-linear range of operation.

56.   The method of claim 53, wherein determining the constant value comprises theorizing behavior of a sensor array through a non-linear range of operation.

57.   The method of claim 4, wherein estimating the excess signal further comprises calculating the excess signal using a power function.

58.   The method of claim 57, wherein the power function comprises:
           calculating a coefficient using a reference image frame and the frame rate; and
           calculating an excess signal using the coefficient and the frame rate.

59.   The method of claim 4, wherein estimating the excess signal further comprises selecting the excess signal from a look-up table.

60.   The method of claim 59, wherein selecting the excess signal from the look-up table further comprises selecting a pre-calculated excess signal from the look-up table using the measured signal of the image frame and a frame number of the image frame, the frame number is calculated using a frame time of the image frame and the frame rate.

61.   The method of claim 4, wherein estimating the excess signal further comprises calculating the excess signal using a recursive function.

62.   The method of claim 61, wherein the recursive function comprises determining the excess signal of a next frame using a first previous frame and a second previous frame.

63.   The method of claim 62, wherein determining the excess signal of the next frame further comprises:
        calculating a first coefficient using a measured signal and a difference in time between a frame time of the first previous frame and a frame time of the second previous frame, the measured signal corresponds to at least one of the measured signal of the first previous frame and the measured signal of the second previous frame;
            calculating a second coefficient using the first coefficient; and
            calculating the excess signal of the next frame using the second coefficient and the measured signal.

64. An apparatus, comprising:

an imager; and

a processor coupled with the imager and configured to compensate for an excess signal in the imager based on a frame rate.

65. The apparatus of claim 64, wherein the imager comprises:

a photoconductor;

a capacitor coupled to the photoconductor; and.

a switch coupled to the capacitor.

66. The apparatus of claim 65, wherein the excess signal is representative of charge contribution from a current through the switch.

67. The apparatus of claim 65, wherein the switch generates the excess signal.

68. The apparatus of claim 65, wherein the photoconductor generates the excess signal.

69. The apparatus of claim 65, wherein the capacitor generates the excess signal.

70. The apparatus of claim 64, wherein the processor is configured to cause the compensation by subtracting an estimation of the excess signal based on the frame rate.

71. The apparatus of claim 70, wherein the excess signal is a non-linear signal.

72. The apparatus of claim 70, wherein the processor is configured to estimate the excess signal over an integration time.

73. The apparatus of claim 70, wherein the processor is configured to estimate the excess signal using a power function.

74. The apparatus of claim 70, wherein the processor is configured to estimate the excess signal using a look-up table.

75. The apparatus of claim 70, wherein the processor is configured to estimate the excess signal using a recursive function.

76. The apparatus of claim 70, wherein the integration time is the reciprocal of the frame rate.

77. The apparatus of claim 64, wherein the frame rate is at least 0.1 frames per second (FPS).

78. The apparatus of claim 64, wherein the imager is a flat panel imager.

79. The apparatus of claim 78, wherein the imager comprises amorphous silicon photodiodes.

80.   A apparatus, comprising:

means for detecting an excess signal in an imager; and

means for compensating for the excess signal in the imager based on a frame rate at which the imager is operating.

81.   The apparatus of claim 80, further comprising:

means for receiving light; and

.   means for generating an electric current in the imager proportional to the received light, wherein the electric current includes the excess current, wherein the excess current is an integration of the excess current over the integration time.